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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,808	04/12/2004	Thomas Pnoik	75DE00606	7665
7590	09/20/2005		EXAMINER	
John S Beulick Armstrong Teasdale Suite 2600 One Metropolitan Square St Louis, MO 63102			PATEL, PARESH H	
			ART UNIT	PAPER NUMBER
			2829	
				DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/019,808	PNOIK ET AL.	
	Examiner Paresh Patel	Art Unit 2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 13 January 2003 and 12 April 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-11 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 April 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Specification***

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Content of Specification

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- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.

Or alternatively, Reference to a "Microfiche Appendix": See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.

- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
 - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
 - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."

- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet

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published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

- (I) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

Drawings

1. New corrected drawings in compliance with 37 CFR 1.121(d) is required in this application because page 1 is missing from drawing submitted on 04/12/2004. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

2. New claims (i.e. Claims 1-11) in compliance with 37 CFR 1.121 are required in this application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 2, it is not clear, what is used to subtracts the output signals of the Hall effect sensor.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States.

6. Claims 1-2, 4 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Trontelj Janez (Horsrmann Timers & Controls Limited, GB. WO 96/28738 [09/19/1996].

Regarding claim 1, Trontelj Janez (hereafter Janez) discloses a current sensing unit comprising

at least two Hall sensors [2, 2'] arranged on a conductor (3rd paragraph, page 2],

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said Hall sensors being arranged such that they detect a magnetic field [3rd paragraph, page 2] generated by a current flowing through the conductor equally [last paragraph, page 2] in absolute amount as well as an interference field [errors] equally in absolute amount and detect either the magnetic field or the interference field [lines 1-4 of page 4] with the sign being different [line 1, page 3], respectively.

Regarding claim 2, Janez discloses a current sensing unit according to claim 1, wherein

the Hall sensors are arranged [last line of page 2 and first line of page 3] such that the magnetic field generated by the current flowing through the conductor is detected by both Hall sensors with the sign being different, respectively, and the output signals of the Hall sensors (1a, 1b) are subtracted from each other [line 3 on page 6].

Regarding claim 4, Janez discloses a current sensing unit according to claim 1, said two Hall sensors being arranged such that the conductor extends between the two Hall sensors [last paragraph of page 2].

Regarding claim 8, Janez discloses a current sensing unit according to claim 1, said Hall sensors having the same distance to the conductor, respectively [last paragraph of page 2].

Regarding claim 9, Janez discloses a current sensing unit according to claim 2, wherein a plurality of pairs of Hall sensors are provided, wherein the output signals of each pair are subtracted [e.g. see equation 7] from each other by a subtractor and the

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resulting output signals from the pairs of Hall sensors being added by an adder [e.g. see equation 10].

7. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Tomaki (JP-A-57128854).

Regarding claim 1, Tomaki in the Abstract discloses a current sensing unit comprising at least two Hall sensors [8a., 8b] arranged on a conductor [bus], said Hall sensors being arranged such that they detect a magnetic field generated by a current flowing through the conductor equally in absolute amount as well as an interference field equally in absolute amount and detect either the magnetic field or the interference field with the sign being different, respectively.

Regarding claim 3, Tomaki in the Abstract discloses a current sensing unit according to claim 1, wherein

the Hall sensors are arranged such that the magnetic field generated by the current flowing through the conductor is detected by both Hall sensors with the signs being equal, and the output signals of the Hall sensors are added [voltage component].

8. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Wally E. Rippel (Hall-Effect Current Sensors for Integrated Circuits, National Aeronautics and Space Administration).

Regarding claim 1, Wally E. Rippel (hereafter Wally) in figure discloses a current sensing unit comprising

at least two Hall sensors [sensor 1-2] arranged on a conductor [Strip],

said Hall sensors being arranged such that they detect a magnetic field generated by a current flowing through the conductor equally in absolute amount as well as an interference field equally in absolute amount and detect either the magnetic field or the interference field with the sign being different, respectively [last three lines of column 1 and first eight lines of column 2].

9. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Shimizu et al. (JP 59007269 A).

Regarding claim 1, Shimizu et al. (hereafter Shimizu) discloses a current sensing unit comprising

at least two Hall sensors [3, 3a] arranged on a conductor [wire],
said Hall sensors being arranged such that they detect a magnetic field generated by a current flowing through the conductor (2) equally in absolute amount as well as an interference field equally in absolute amount and detect either the magnetic field or the interference field with the sign being different, respectively [see Abstract].

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janez as applied to claim 1 above.

Regarding claims 5-7, Janez discloses all the elements except for a shield mounted around the Hall sensors and the conductor; said conductor being a circular conductor; and said Hall sensors having the least possible distance to each other. It would have been obvious to person having ordinary skill in the art to provide shielding because the shielding mentioned in Claim 5 is routinely employed as required in the field of magnetic Sensors. It is generally known that, in a power supply network, conductors are of either rectangular (e.g. in current multi-terminal busbars) or round (e.g. overhead lines or cables) section also in this connection reference WO 96/28738, in particular the paragraph starting at the bottom page where such a conductor is explicitly indicated in a power supply network). Since it is also generally known that, for geometric reasons, the magnetic field that forms about a round conductor is more uniform than that about an angular conductor, a person skilled in the art will, where possible, prefer a round conductor to an angular conductor as a measuring point (as claimed Claim 6 as filed). Also, locating Hall-effect sensors as close to each other spatially as possible (cf. Claim 7 as filed) (in order to ensure that, as far as possible, each sensor is exposed to the same field) represents an obvious technical measure in the present specialized area.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomaki as applied to claims 3 and 1 above.

Regarding claim 10, Tomaki discloses all the elements except for current sensing unit according to claim 3. wherein a plurality of pairs of Hall sensors are provided, wherein the output signals of each pair are added by an adder and the resulting output

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signals from the pairs of Hall sensors are added by an adder. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Tomaki, since as large number of sensors as claimed (cf. e.g. WO 96/28738, in particular Claims 1, 8 and 11), it is normal expert practice to combine the signals so as to ensure the intended multiplication of the desired signals and elimination of the undesired signals by addition and subtraction, respectively.

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tomaki or Janez as applied to claim 1 above, and further in view of Taivalkoski et al. (US 6397686).

Regarding claim 11, Tomaki or Janez disclose all the elements except for the output signal of a Hall sensor is supplied to a temperature compensation sensor. Taivalkoski et al. discloses a current sensing unit according to claim 1, wherein the output signal of at least one of the Hall sensors is supplied to a temperature compensation sensor [see claim 20]. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Tomaki or Janez with temperature sensor of Taivalkoski et al. (to measure the temperature), because Hall-effect sensors are generally known to be temperature-sensitive. A person skilled in the art will therefore, as required, apply one of the many known and routinely employed temperature-compensating procedures.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paresh Patel whose telephone number is 571-272-1968. The examiner can normally be reached on 8:00 to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 571-272-2034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paresh Patel
Primary Examiner
Art Unit 2829



September 16, 2005